

Re: My New Website

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From: Lothar Brendel (*l.no.spam.brendel_at_uni-duisburg.de*)

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Y.Porat wrote:

> *Bjoern Feuerbacher* <*feuerbac@thphys.uni-heidelberg.de*> wrote in message
news:<c9ndqe\$ode\$I@news.urz.uni-heidelberg.de>...

>

>>Y.Porat wrote:

[...]

>>>*more clear – i did to myself such 3d models*

>>>*and it helped me a lot though i am trained by my proffession*

>>>*to read 3d structures while i had to compute volumes*

>>>**that belong to a single sphere* it was nearly indepensible*

>>>*or else you are fet lost in the littel 3d detailes*

>>

>>*Well, the 3D model shown in that document is far clearer than any*

>>*of the 3D pictures in your book. Apparently you have to practice*

>>*drawing them a bit more...*

>

> -----

> *what i show in my model is what Mr Brendel calles*

> *'the primitive unit'*

I don't know the picture of your model you're referring to, but somehow
I have doubts about that. Do you really show a rhombohedron there?

> *and it is either i am apoor explainer*

> *or that both of you are slow about the problem.*

What is your basis to get arrogant?

> *actually it is confusing but we have to make it clear*

> *anyway:*

> *the problem with our discussion is that*

> *both of you*

> **take it for granted* that the promitive unit is composed of*

> **one atom**

No! I don't claim that it is "composed of one atom" but that it contains two atoms. And I can take it for granted because it is defined so.

- > *while i claim that it is composed*
- > *of more than one!*

First you have to define your "unit cell".

- > *and that is the core and crux of our discussion.*
- > *i dont waht you to take it for granted i whant to prove*
- > *or disprove *just that for granted assumption**
- > *it can be done only*
- > *by findind how many atoms per say 1 cubic centimetr*
- > *and !!!!!*

Instead of $(1\text{cm})^3$ let's choose $(0.357\text{nm})^3$. We know from X-ray scattering, that this voulme holds 8 atoms. Can't we conclude from that $1.75 \cdot 10^{23}$ atoms in one cm^3 ?

- > *listen care fully*
- > *take the x ray obsrevations*
- > *you see there (litrally see!) what is that we see there*

Did you ever see pictures of X-ray scattering?

- > *we see some 'points' what ever it is or whaever you call it*
- > *we can call it 'the primitive latice builder' ok?*

No, that's not what we see there. If you think otherwise, show us such a picture.

What you call PLB is already known as "unit cell". There can be different ones of different shapes and volume, but for a given crystal, they have the same number of atoms/volume.

- > *so we have to finds out*
- > **how many primitive latice builders (PLB) we have*
- > *in a cubic cm*

Okay: The volume of diamond's conventional unit cell (one realisation of what you call PLB) is known to be $(0.357\text{nm})^3 = 4.55 \cdot 10^{-23} \text{cm}^3$. Hence, in 1cm^3 we have $1/(4.55 \cdot 10^{-23}) = 2.2 \cdot 10^{22}$ of them.

- > *and divide the number of atoms with the number of PLD (per cm^3)*
- > *what i claim is that the answer will be a surprise.*

If we use the density of diamond $3.51\text{g}/\text{cm}^3$ and the mass of a carbon atom $2 \cdot 10^{-23}\text{g}$, we get $1.76 \cdot 10^{23}$ atoms/ cm^3 . If we divide that by $2.2 \cdot 10^{22}/\text{cm}^3$ we get 8 atoms/unit cell, which we already knew. Where's the surprise?

- > *it will be more than one atom in a PLB–*
- > *not in all but in too many lattice structures!*
- > *(the diamond for sure for me more than one atom.)*

So you dispute diamond to have a regular lattice altogether?

- > *and that will lead*
- > *to some more revolutionay understanding about the*
- > *structure of matter*
- > *(so it desreves an effort)*

How do you explain the agreement between

- a) density + atom mass
- b) X–ray experiments
- c) STM experiments
- ?

- > *so we have to simply find the volume that one PLB ocupies*
- > *if 'ocupies' makes it more clear than my 'avrage volume unit'*

We know the volume of the conventional as well as of the primitive unit cell (both are PLBs in your language).

- > *btw Mr Brendel you dont have to explain to me how nice and regular*
- > *and exact and unambiguous– is the diamond structre i know it years ago*
- > *anyway:*
- > *TIA*

TIA?

If you know that it is so nice and regular, how come that you claim it has "more than one atom in a PLB– not in all but in too many latitce structures"? So you claim that diamond is less regular than the so called diamond lattice structure?

asks

Lothar